

## AMENDMENTS TO THE CLAIMS

Please amend the claims in the identified application as specified hereinafter.

Claims 1-12 (Cancelled).

13. (Currently Amended). ~~The Probe of claim 4, wherein said monitoring system further comprises a respiratory plethysmograph for monitoring respiration and respiratory motions of an animal.~~ A probe useful for slow Magic Angle Spinning Magnetic Resonance Imaging and Spectroscopy, the probe comprising:

(a) at least one base member for supporting said probe;

(b) a shielding member mounted to said base member;

(c) at least one gradient assembly comprising a plurality of gradient coil(s) housed within said shielding member mounted to said base member;

(d) an RF circuit assembly comprising at least one R.F. NMR coil(s) mounted to said member;

(e) a rotor assembly for spinning a specimen, said assembly disposed so as to be in optimum alignment with said gradient coil(s) and said NMR coil(s);

(f) a driving assembly operably connected with said rotor assembly for driving said rotor assembly;

(g) a monitoring system comprising a respiratory plethysmograph operably disposed for monitoring respiration and/or respiratory motions of an animal or other living specimen being rotated or subjected to a rotating magnetic field; and

(h) wherein said rotor assembly is rotatable about an axis positioned at a magic angle of  $54.44^\circ$  relative to an applied magnetic field  $B_0$ , at spin speeds of less than 100Hz.

14. (Currently Amended). ~~The Probe of claim 1 further comprising an optical detector system having transistor-to-transistor logic pulse sequencing whereby said sequencing is adapted to trigger corresponding RF pulse sequencing in synchronization with precision markers mounted on said rotor assembly.~~ A probe useful for slow Magic Angle Spinning Magnetic Resonance Imaging and Spectroscopy, the probe comprising:

(a) at least one base member;

(b) a shielding member mounted to said base member;

(c) at least one gradient assembly comprising a plurality of gradient coil(s) housed within said shielding member mounted to said base member;

(d) an RF circuit assembly comprising at least one R.F. NMR coil(s) mounted to said base

member;

(e) a rotor assembly for spinning a specimen, said assembly disposed so as to be in optimum alignment with said gradient coil(s) and said NMR coil(s);

(f) a driving assembly operably connected with said rotor assembly for driving said rotor assembly;

(g) an optical detector system having transistor-to-transistor logic pulse sequencing whereby said sequencing is adapted to trigger corresponding RF pulse sequencing in synchronization with precision markers mounted on said rotor assembly; and

(h) wherein said rotor assembly is rotatable about an axis positioned at a magic angle of 54.44° relative to an applied magnetic field  $B_0$ , at spin speeds of less than 100Hz.

Claims 15-18 (Cancelled).

19. (Currently Amended). ~~The Probe of claim 1 wherein said rotor assembly further comprises a first and second cylinder, said second cylinder being adapted for insertion of an epoxy photopolymer cylindrical mold for mounting a specimen snugly fluid filled object within said rotor.~~

A probe useful for Magnetic Resonance Imaging and Spectroscopy, the probe comprising:

(a) at least one base member for supporting said probe;

(b) a shielding member mounted to said base member;

(c) at least one gradient assembly comprising a plurality of gradient coil(s) housed within said shielding member mounted to said base member;

(d) an RF circuit assembly comprising at least one R.F. NMR coil(s) mounted to said base member;

(e) a rotor assembly for spinning a specimen, said rotor assembly comprising a first and second cylinder, said second cylinder being adapted for insertion of a cylindrical mold for mounting an animal or other living specimen snugly within said rotor, said assembly disposed so as to be in optimum alignment with said gradient coil(s) and said NMR coil(s);

(f) a driving assembly operably connected with said rotor assembly for driving said rotor assembly; and

(g) wherein said rotor assembly is rotatable about an axis positioned at a magic angle of 54.44° relative to an applied magnetic field  $B_0$ , at spin speeds of less than 100Hz.

Claims 20-23 (Cancelled).

24. (Currently Amended). ~~The Probe of claim 23, wherein said driving assembly further comprises three sets of pulleys for rotating the rotor assembly, a 1<sup>st</sup> set comprising a single pulley, a 2<sup>nd</sup> set comprising two pulleys, and a 3<sup>rd</sup> set comprising a single pulley, wherein said pulley in said 1<sup>st</sup> set is attached to said rotor, said 2<sup>nd</sup> set has a single rotational axis whereby said pulleys rotate in opposite directions and whereby the axis of said 2<sup>nd</sup> set of pulleys is perpendicular to the rotational axis of said 1<sup>st</sup> set, and whereby said 3<sup>rd</sup> set is operably connected to said driving motor~~ A probe useful for slow Magic Angle Spinning Magnetic Resonance Imaging and Spectroscopy, the probe comprising:

(a) at least one base member for supporting said probe;

(b) a shielding member mounted to said base member;

(c) at least one gradient assembly comprising a plurality of gradient coil(s) housed within said shielding member mounted to said base member;

(d) an RF circuit assembly comprising at least one R.F. NMR coil(s) mounted to said base member;

(e) a rotor assembly for spinning a specimen, said rotor assembly comprising a first and second cylinder, said second cylinder being adapted for insertion of an epoxy photopolymer cylindrical mold for mounting an animal or other living specimen snugly within said rotor, said assembly disposed so as to be in optimum alignment with said gradient coil(s) and said NMR coil(s);

(f) a driving assembly operably connected with said rotor assembly, said driving assembly comprising three sets of pulleys for rotating said rotor assembly, a 1<sup>st</sup> set comprising a single pulley, a 2<sup>nd</sup> set comprising two pulleys, and a 3<sup>rd</sup> set comprising a single pulley, wherein said pulley in said 1<sup>st</sup> set is attached to said rotor, said 2<sup>nd</sup> set has a single rotational axis whereby said pulleys rotate in opposite directions whereby the axis of said 2<sup>nd</sup> set of pulleys is perpendicular to the rotational axis of said 1<sup>st</sup> set, and whereby said 3<sup>rd</sup> set is operably connected to said driving motor to spin said rotor in an optimal driving arrangement; and  
(g) wherein said rotor assembly is rotatable about an axis positioned at a magic angle of 54.44° relative to an applied magnetic field  $B_0$ , at spin speeds of less than 100Hz.

28. (New). A probe useful for slow Magic Angle Spinning Magnetic Resonance Imaging and Spectroscopy, the probe comprising:

(a) at least one base member for supporting said probe;

(b) at least one gradient assembly comprising a plurality of gradient coil(s) mounted to said base member;

(c) an RF circuit assembly comprising at least one R.F. NMR coil(s) mounted to said base

member;

(d) a rotor assembly for spinning a specimen, said assembly disposed so as to be in optimum alignment with said gradient coil(s) and said NMR coil(s);

(e) a driving assembly operably connected with said rotor assembly for driving said rotor assembly, said driving assembly comprising a driving belt and at least one rotor pulley configured to spin said rotor in an optimal driving arrangement;

(f) an optical detector system having transistor-to-transistor logic pulse sequencing operably disposed for triggering corresponding RF pulse sequencing in synchronization with precision markers mounted on said rotor assembly;

(g) a computer-controlled monitoring system operably disposed for collecting sample measurement data, said monitoring system comprising a respiratory plethysmograph operably disposed for monitoring respiration and/or respiratory motions of an animal or other living specimen; and

(h) wherein said rotor assembly is rotatable about an axis positioned at a magic angle of  $54.44^\circ$  relative to an applied magnetic field  $B_0$  at spin speeds of less than 100Hz and wherein said rotor assembly comprises a first and second cylinder, said second cylinder comprising a specimen holder moveable within said second cylinder for centering a volume of interest of said specimen within a homogeneous region of: i) a magnet providing said magnetic field  $B_0$  ii) said NMR coils iii) and/or said gradient coils within said rotor.